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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,483	09/29/2003	Michihiko Yanagisawa	506212001200	8479

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EXAMINER

LUND, JEFFRIE ROBERT

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 08/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/671,483

Applicant(s)

YANAGISAWA ET AL.

Examiner

Jeffrie R. Lund

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 June 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5-20 is/are pending in the application.
- 4a) Of the above claim(s) 18-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 5-17 in the reply filed on February 2, 2005 is acknowledged.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 5-17 are rejected under 35 U.S.C. 103(a) as being obvious over Nishibe, JP 5-029262, in view of Tanaka et al, US Patent 6,302,995 B1, and Shinozuka et al, US Patent 6,315,858 B1. (Abstract; Figures

Nishibe teaches an etching system that includes a first vacuum chamber 3, a second vacuum chamber 4, and a vacuum transfer path 7 communicating with the two vacuum chambers with a transport device that grips the wafer. Each vacuum chamber is connected to a common or individual vacuum pump and set and controlled such that the etching conditions (i.e. vacuum pressure, type of gas such as CF₄ etc) in each chamber are different.

Nishibe differs from the present invention in that Nishibe does not teach: a small diameter nozzle opening to the first chamber; a large diameter nozzle opening to the second chamber; a microwave activated species gas generator; feeding devices, including a wafer table, for supporting a silicon on insulator wafer in each chamber and

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scanning it under the nozzle; a gas supply for supplying SF₆, NF₃, or CF₄ gas; a controller for controlling the gas flow through the nozzles; the specific size of the nozzles; that the diameters of the nozzles are adjustable; a transport device that grips the wafer; or that the surface unevenness is removed in the first chamber and the layer is etched in the second chamber.

Tanaka et al teaches a local etching apparatus that includes: a processing chamber 9 connected to a vacuum pump 91; a nozzle 20 opening to the chamber; a microwave activated species gas generator 10, 11, 12, 13, 14; a X-Y drive device 4 (feeding device), including a wafer table 90, for supporting a wafer and scanning it under the nozzle; a gas supply 31 for supplying SF₆ gas; and a controller 33 for controlling the gas flow through the nozzles. (Entire document)

Shinozuka et al teaches a gas polishing apparatus that includes: a chamber 10 connected to a vacuum pump 59; a plurality of nozzles 230a-230c of various sizes; an X-Y wafer table 11, for supporting a wafer and scanning it under the nozzle; a gas supply 247 for supplying a gas; and a controller 243 for controlling the gas flow through the nozzles. (Figure 11) Shinozuka et al also teaches that the diameters of the nozzles are adjustable (Figure 6), and that the diameter of the nozzle is based on polishing requirements (column 10 lines 52-62).

Silicon on insulator wafers are well known in the art.

The motivation for replacing each of the generic etching chambers of Nishibe with the etching chamber of Tanaka et al is to provide a specific etching chamber as required by Nishibe but only generically described.

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The motivation for optimizing the size of the nozzles or making the nozzles adjustable in the apparatus of Nishibe and Tanaka et al is to optimize the size of the nozzles to meet the desired processing requirements (i.e. small for fine etching and large for general etching) as taught by Shinozuka et al.

The motivation for etching a silicon on insulator wafer is to etch a silicon on insulator wafer. Furthermore, it has been held that "expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969); and the "inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims." *In re Young*, 25 USPQ 69 (CCPA 1935) (as restated in *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

The motivation for performing a specific etching process (i.e. removing surface unevenness in the first chamber and etching the layer in the second chamber) is to perform the desired process on the desired wafer to produce a desired result (i.e. a planar wafer having a silicon layer of desired thickness). The specific process performed in the apparatus is an intended use of the apparatus and it has the held that: claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danley*, 120 USPQ 528, 531, (CCPQ 1959); "Apparatus claims cover what a device is, not what a device does" (Emphasis in original) *Hewlett-Packard Co. V. Bausch & Lomb Inc.*, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990); and a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed

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apparatus from a prior art apparatus “ if the prior art apparatus teaches all the structural limitations of the claim *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Also see MPEP 2114.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace each of the generic etching chambers of Nishibe with the etching chamber Tanaka et al, to optimize the size of the nozzles in the apparatus of Nishibe and Tanaka et al as taught by Shinozuka et al, and to process the desired type of wafer with the desired process.

Response to Arguments

4. Applicant's arguments filed June 7, 2005 have been fully considered but they are not persuasive.

The arguments are based on the idea of “etching order” and that the etching order “is contrary to the conventional teaching of the prior art”. These arguments depend on how the apparatus is used and do not add any structure to the apparatus.

The claims require an etching apparatus with two vacuum chambers connected by a transfer chamber, and a small nozzle in a first chamber and a larger nozzle in a second chamber. The combined apparatus of Nishibe, Tanaka et al, and Shinozuka et al teaches this structure.

The Applicant also argues that the method of etching in which a general etching of the surface of a substrate with a large nozzle followed by fine etching with a small nozzle is known. The Examiner submits that any apparatus that can perform this

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method is the same as the claimed apparatus, because the apparatus has all the claimed structure and differs only in how it is used.

The Examiner further notes that the specific use of the apparatus (i.e. the order in which the wafers are etched) is an intended use of the apparatus and it has the held that: claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danley*, 120 USPQ 528, 531, (CCPQ 1959); "Apparatus claims cover what a device is, not what a device does" (Emphasis in original) *Hewlett-Packard Co. V. Bausch & Lomb Inc.*, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990); and a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus " if the prior art apparatus teaches all the structural limitations of the claim *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Also see MPEP 2114. The apparatus of Nishibe, Tanaka et al, and Shinozuka et al can be used to perform either desired etching method i.e. fine etching with a small nozzle followed by general etching with a large nozzle or vise versa without changing the structure of the apparatus at all.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not


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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrie R. Lund whose telephone number is (571) 272-1437. The examiner can normally be reached on Monday-Thursday (6:30 am-6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jeffrie R. Lund
Primary Examiner
Art Unit 1763

JRL
8/18/05